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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/040,042	11/07/2001	Wei-Yu Su	TS01-132	1835

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EXAMINER

EL ARINI, ZEINAB

ART UNIT PAPER NUMBER

1746

DATE MAILED: 02/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

10/040,042

**Applicant(s)**

SU, WEI-YU

**Examiner**

Zeinab E. EL-Arini

**Art Unit**

1746

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on 29 November 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 11/29/04 has been entered.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kern or Hanson et al.

Kern discloses a method of cleaning a substrate. The process comprises contacting the substrate with cleaning solution comprising ammonium hydroxide , hydrogen peroxide, and water, and agitating the

solution using megasonic energy, and exposing the substrate for certain amount of time to the cleaning process or removing the contaminants from the substrate. The pH of the cleaning solution is about 8 (read on the alkaline cleaning solution). See the document in general. The reference does not teach repeating the cleaning process and the ratio as claimed. The reference discloses postcleaning after photoresist stripping is necessary for every mask level throughout the production process (read on repeating step). See pages 1887-1888.

It would have been obvious for one skilled in the art to adjust the ratio to obtain optimum results. Also, the reference teaches using a multiple number of cleaning cycles to clean the substrate , which is functionally equivalent to the cleaning process.

It would have been obvious for one skilled in the art to repeat the cleaning cycles to obtain optimum results. Also the limitations of claims 3 and 10 are inherent in Kern's process.

Hanson et al. teach a process and apparatus for semiconductor device fabrication. Hanson et al. teach cleaning the substrate by using solution comprising  $\text{NH}_4\text{OH}$ ,  $\text{H}_2\text{O}_2$ ,  $\text{H}_2\text{O}$ , and having pH of about 9 to about 11. Hanson et al. also teach that the amount of time the substrate is

cleaned is largely matter of design choice. The reference also teaches agitating the cleaning solution and the temperature range as claimed. See col. 1, line 10- col. 4, line 23. The reference also teaches cleaning the photomasks as claimed, see col. 1, lines 46-54. The reference does not teach the multiple numbers of cleaning cycles, the ratio, and the limitations of claims 3 and 10 as claimed.

It would have been obvious for one skilled in the art to adjust the ratio, and using multiple numbers of cleaning cycles to obtain optimum results. The limitations of claims 3 and 10 are inherent in the Hanson et al. reference.

Kern and Hanson et al. do not teach the steps as claimed.

It would have been obvious for one skilled in the art to use Kern or Hanson et al. process to obtain the claimed process. This is because the process taught by Kern or Hanson et al. is functionally equivalent to the process as claimed.

Claims 14-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kern or Hanson et al. in combination with Lee et al.

Kern or Hanson et al. as discussed supra do not teach the photomasks claimed in claims 14-17.

Lee et al. disclose a method of repairing a defect in a photomask. The reference discloses the photomasks as claimed. See the abstract, col. 2, lines 39-65.

It would have been obvious for one skilled in the art to use the method taught by Kern or Hanson et al. to clean the photomasks of Lee et al. to obtain the claimed process.

Claims 2, 6, 9, and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nagamura et al.

Re claims 2, 6, 9, 13, Nagamura et al. as discussed supra do not teach the ratio and the number of cleaning cycles as claimed.

It would have been obvious for one skilled in the art to adjust the ratio and number of cleaning cycles to obtain optimum results. The number of cleaning cycles depends on the amount of the particles and the residues on the photomasks.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 4-5, 7-8, 11-12, and 14-17 are rejected under 35 U.S.C. 102(b) as being anticipated by Nagamura et al. (6,071,376).

Re claims 1, 4-5, 7-8, 11-12, 14-17, Nagamura et al. disclose a method and apparatus for cleaning a photomask to be used in the photolithography step in the process for the production of semiconductor integrated circuit device. The reference discloses treating the photomask by contacting with a solution comprising ammonium hydroxide, hydrogen peroxide and water, agitating the solution by using ultrasonic , and the multiple number of cleaning cycles, and the photomasks (claims 1, 7), the temperature (claims 4, 11), The pH (claims 5, 12), and the limitation of claims 8, 14-17. See col. 1, lines 13-20,, lines 28-33, 49-55, col. 2, lines 22-33, 40-62, col. 4, lines 17-48, col. 8, lines 28-35, col. 9, lines 1-51, Figs. 5-6, and the document in general. Removing particles and residues greater than about 0.2 microns is inherent in Nagamura et al. process.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Zeinab E. EL-Arini whose telephone number is (571) 272-1301. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Barr can be reached on (571) 272-1414. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

*Zeinab Elarini*  
Zeinab E. EL-Arini  
Primary Examiner  
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